STATE OF WISCONSIN

A REASSESSMENT OF EMERGENCY MEDICAL SERVICES

APRIL 24-26, 2001

National Highway Traffic
Safety Administration
Technical Assistance Team

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TABLE OF CONTENTS

Subject **Page**

BACKGROUND

Injury is the leading cause of death for persons in the age group one through 44, as well as the most common cause of hospitalizations for persons under the age of 40. The financial costs of injuries are staggering: injuries cost billions of dollars in health care and social support resources. In 1990, for example, the lifetime costs of all injuries were estimated at $215 billion annually. These estimates do not include the emotional burden resulting from the loss of a child or loved one, or the toll of severe disability on the injured person and his or her family. Each year over 40,000 people lose their lives on our nation's roads, and approximately 70 percent of those fatalities occur on rural highways. The National Highway Traffic Safety Administration (NHTSA) is charged with reducing death and injury on the nation's highways. NHTSA has determined that it can best use its limited resources if its efforts are focused on assisting states with the development of integrated emergency medical services (EMS) programs that include comprehensive systems of trauma care.

To accomplish this goal, in 1988 NHTSA developed a Technical Assistance Team (TAT) approach that permitted states to utilize highway safety funds to support the technical evaluation of existing and proposed emergency medical services programs. Following the implementation of the Assessment Program NHTSA developed a Reassessment Program to assist those States in measuring their progress since the original assessment. The Program remains a tool for states to use in evaluating their statewide EMS programs. The Reassessment Program follows the same logistical process, and uses the same ten component areas with updated standards. The standards now reflect current EMS philosophy and allow for the evolution into a comprehensive and integrated health management system, as identified in the 1996 *EMS Agenda for the Future*. NHTSA serves as a facilitator by assembling a team of technical experts who demonstrate expertise in emergency medical services development and implementation. These experts demonstrate leadership and expertise through involvement in national organizations committed to the improvement of emergency medical services throughout the country. Selection of the Technical Assistance Team is also based on experience in special areas identified by the requesting State. Examples of specialized expertise include experience in the development of legislative proposals, data gathering systems, and trauma systems. Experience in similar geographic and demographic situations, such as rural areas, coupled with knowledge in providing emergency medical services in urban populations is essential.

The Wisconsin Bureau Emergency Medical Services and Injury Prevention in concert with the Wisconsin Bureau of Transportation Safety requested the assistance of NHTSA. NHTSA agreed to utilize its technical assistance program to provide a technical reassessment of the Wisconsin Statewide EMS program. NHTSA developed a format whereby the EMS office staff coordinated comprehensive briefings on the EMS system.

The TAT assembled in Madison, Wisconsin, on April 24-26, 2001. For the first day and a half, over 30 presenters from the State of Wisconsin, provided in-depth briefings on EMS and trauma care, and reviewed the progress since the 1990 assessment. Topics for review and discussion included the following:

General Emergency Medical Services Overview of System Components

- Regulation and Policy
- Resource Management
- Human Resources and Training
- Transportation
- Facilities
- Communications
- Trauma Systems
- Public Information and Education
- Medical Direction
- Evaluation

The forum of presentation and discussion allowed the TAT the opportunity to ask questions regarding the status of the EMS system, clarify any issues identified in the briefing materials provided earlier, measure progress, identify barriers to change, and develop a clear understanding of how emergency medical services function throughout Wisconsin. The team spent considerable time with each presenter so that they could review the status for each topic.

Following the briefings by presenters from the Wisconsin Bureau of Emergency Medical Services and Injury Prevention, public and private sector providers, and members of the medical community, the TAT sequestered to evaluate the current EMS system as presented and to develop a set of recommendations for system improvements.

When reviewing this report, please note that the TAT focused on major areas for system improvement. Unlike the state's initial assessment which contained many operational recommendations, several of which were identified as a priority, this report offers fewer yet broader recommendations that the team believes to be critical for continued system improvement.

The statements made in this report are based on the input received. Pre-established standards and the combined experience of the team members were applied to the information gathered. All team members agree with the recommendations as presented.

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ACKNOWLEDGMENTS

The TAT would like to acknowledge the Wisconsin Department of Transportation, Bureau of Transportation Safety and the Wisconsin Department of Health and Family Services, Bureau of Emergency Medical Services and Injury Prevention for their support in conducting this assessment.

The TAT would like to thank all of the presenters for being candid and open regarding the status of EMS in Wisconsin. Each presenter was responsive to the questions posed by the TAT, which aided the reviewers in their evaluation. Many of these individuals traveled considerable distance to participate.

Special recognition and thanks should be made regarding the extraordinary efforts taken by Jon Morgan, Director of Bureau of EMS and Injury Prevention, and his staff, and the briefing participants for their well-prepared and forthright presentations. In addition, the Team applauds the well-organized, comprehensive briefing material sent to the team members in preparation for the reassessment.

Special thanks also to Don Hagen, Bureau of Transportation Safety, for providing assistance to the TAT.

INTRODUCTION

Wisconsin is a large, beautiful and diverse state. The contrast of large urban areas and small sparsely populated rural communities creates challenges for providing a comprehensive, quality statewide EMS system. To this point, the spirit of volunteerism, neighbors helping neighbors, and people working hard to provide state-of-the-art care to Wisconsin's communities have met these challenges.

In 1990 Wisconsin requested a NHTSA assessment of its EMS system. Using the resulting recommendations as a guide, Wisconsin has made tremendous strides in improving its EMS system during the past eleven years.

Now is the time to recognize past accomplishments and look boldly to the future. This reassessment report represents one of the tools that Wisconsin EMS has chosen to guide its efforts into this decade.

Despite the outstanding progress of the past eleven years, much remains to be done. Some of the barriers to progress that existed eleven years ago are still present today. Dedicated people throughout the state, both paid and volunteer, doing a job with little recognition and inadequate resources have created monumental achievements. But even dedication and hard work can carry Wisconsin only so far. Currently, resources are being cut and personnel and financial support to maintain and continue improving the EMS system in Wisconsin have eroded to the point that the system is in danger of collapse. Even with a host of volunteers, a stable, continuing funding source must be obtained for the Bureau of EMS and Injury Prevention and personnel resources must be allocated to meet the demand for services to the public, the EMS volunteer and career personnel and other EMS system partners. The political leadership in Wisconsin must address the real needs facing the Wisconsin EMS system and ensure that stable funding mechanisms and personnel resources are available to maintain a good system and make it even better.

The spirit of the people of Wisconsin will undoubtedly lead its EMS system down the appropriate road and create the best possible care for their communities.

WISCONSIN EMERGENCY MEDICAL SERVICES (WEMS)

The Technical Assistance Team revisited the ten essential components of an optimal EMS system that were used in the *State of Wisconsin, An Assessment of Emergency Medical Services*, on November 13-15, 1990. These components provided an evaluation or quality assurance report based on 1989 standards. While examining each component, the TAT identified key EMS issues, reviewed the State's progress since the original report, assessed its status, and used the 1997 Reassessment Standards as a basis for recommendations for EMS system improvement.

A. REGULATION AND POLICY

Standard

To provide a quality, effective system of emergency medical care, each EMS system must have in place comprehensive enabling legislation with provision for a lead EMS agency. This agency has the authority to plan and implement an effective EMS system, and to promulgate appropriate rules and regulations for each recognized component of the EMS system (authority for statewide coordination; standardized treatment, transport, communication and evaluation, including licensure of out-of-hospital services and establishment of medical control; designation of specialty care centers; PIER programs). There is a consistent, established funding source to adequately support the activities of the lead agency and other essential resources, which are necessary to carry out the legislative mandate. The lead agency operates under a single, clear management structure for planning and policy setting, but strives to achieve consensus among EMS constituency groups in formulating public policy, procedures and protocols. The role of any local/regional EMS agencies or councils who are charged with implementing EMS policies is clearly established, as well as their relationship to the lead agency. Supportive management elements for planning and developing effective statewide EMS systems include the presence of a formal state EMS Medical Director, a Medical Advisory Committee for review of EMS medical care issues and state EMS Advisory Committee (or Board). The EMS Advisory Committee has a clear mission, specified authority and representative membership from all disciplines involved in the implementation of EMS systems.

Progress Since 1990

With limited resources and considerable dedication, the Wisconsin EMS system has made impressive progress with implementation of the 1990 EMS Assessment recommendations including:

- Enacted legislation to designate the Department of Health and Family Services as the state EMS lead agency including a clear specification of its authority and responsibilities.

- Provided several additional FTEs to the Bureau of EMS and Injury Prevention.

- Established the legal authority for a State EMS Medical Director and contracted with a well-qualified physician.

- Established a statewide Physician Advisory Committee.

- Established, via statute, a multi-disciplinary state EMS Board and specified its responsibilities.

- Enacted legislation establishing the State Trauma Advisory Council, authorizing creation of a statewide trauma care system, granting rule-making authority to the department, requiring a statewide trauma care system report to be submitted to the legislature and establishing an initial appropriation for the trauma system.

- Submitted the state trauma systems report to the legislature.

- Enacted legislation for the licensure of First Responders and for First Responder-Defibrillation.

- Published guidelines for the regulation of interhospital transfers and are in the process of updating those guidelines.

Status

A major accomplishment for the Wisconsin EMS System has been the elevation of the EMS Section to the Bureau of Emergency Medical Services and Injury Prevention, a change which has improved the stature of EMS within the Department and improved access to Department leadership.

There are several major laws governing emergency medical services in Wisconsin, including:

- Section 146.50 establishes confidentiality protections for EMS Records and provides broad authority to the Department for:
    - emergency medical services personnel licensing, certification and training;
    - licensing of ambulance service providers;
    - licensure of Emergency Medical Technicians (First Responder, Basic, Intermediate and Paramedic);
    - developing administrative rules regarding the qualifications of EMS medical directors;
    - investigation of complaints;
    - approving EMS education and training programs.

- Section 146.53 establishes the department as the state EMS lead agency, broadly delineates their duties and authorities and provides them with comprehensive rule-making authority. This law also requires the development of a state EMS plan.

- Section 146.55 provides the authority for the development of emergency medical services programs at the local level and requires the submission of operational plans to the Department. Further, it requires a state EMS medical director and establishes the Funding Assistance Program (FAP), which funds tuition of the EMT-Basic training programs and specifies an entitlement funding program to ambulance services.

- Section 146.56 requires the Department to develop and to administer a statewide trauma care system. Section 15.197 establishes a state trauma advisory council to assist in planning and implementing the trauma system. Section 146.58 specifies the responsibilities of the state Emergency Medical Services Board.

The Department of Transportation has statutory responsibility for the inspection and licensure of ambulance vehicles. There is also a Public Access Defibrillation statute.

There are several major sets of administrative rules including:

- HFS 110 relating to Ambulance Provider and EMT-Basic licensure;
- HFS 111 relating to the licensing of Emergency Medical Technicians-Intermediate;
- HFS 112 relating to the licensing of EMT-Paramedics. This is currently under revision to address interfacility transports;
- HFS 113 relating to the Certification of First Responders-Defibrillation;
- HFS 125 relating to Do-Not-Resuscitate Orders;
- Trans 309 relating to inspection of ambulance vehicles.

There are several different groups that provide advice to the Department, including the EMS Board, the State Trauma Care Advisory Council and the Physician Advisory Committee. Each of these boards or committees has a variety of different subcommittees. The EMSC Committee, a committee of the EMS Board, also has several different subcommittees. The Department is commended for its extensive collaboration in the development of department priorities, guidelines and administrative rules. However, the roles and the inter-relationships of the various advisory committees are not clear. For instance, one member of the EMS Board is required to be a member of the State Trauma Advisory Council. However, the formal relationship between these two groups is not clearly delineated. As the trauma system evolves, the absence of a defined relationship will become problematic.

The Funding Assistance Program (FAP) provides state General Purpose Revenue for EMT-Basic training and limited operational support for ambulance services. The amount of funding to individual

ambulance services is quite limited. However, at the state level, these funds represent a significant expenditure resulting only in limited system-wide impact.

The Department has been required to submit numerous reports to the legislature. Every report has been presented, as required. The quality of the reports has been excellent and has obviously consumed considerable effort. However, frequently the legislature does not take action on the reports and the Department and the various constituency groups are not notified of the report's final disposition. There is apparently not a clearly defined method, nor is there the ability, for the Department or the EMS Board to initiate legislation. There have been a variety of defeated legislative efforts including: a mandate for uniform data collection, the assessment of fines for non-compliance with licensure and certification requirements, and various efforts to increase the budget of the Bureau of EMS and Injury Prevention.

The EMS Board has been incredibly active, meeting at least every two months. The amount of volunteer time and effort dedicated by EMS Board members is truly amazing. The EMS Board provides a clear formal and effective method for assuring public dialogue on EMS issues. The Board is frequently frustrated by the delay in appointments. There does not appear to be a systematic method in which the department provides input to the Governor's office on EMS Board appointments.

There currently is no statutory provision for the licensure of air or water EMS services. Rules pertaining to interfacility transfer are currently being revised. These rules also address the continuing education requirements of EMS instructors.

The budget for the Bureau of EMS and Injury Prevention is comprised of General Purpose Revenue, Preventive Health and Health Services Block Grant and other federal funding sources. Because each of these funding sources is extremely volatile, there is not an ongoing, stable source of funding for the Bureau. The absence of adequate and ongoing funding has been detrimental to the overall operation and continuity of the Bureau. There is insufficient funding to accomplish program priorities and existing staff positions are frequently vacant for extended lengths of time.

Frequently, there are unfunded mandates from the legislature; the legislature has established programs (e.g. First Responder certification), but has not provided the department with sufficient resources to manage the program. This has resulted in the frustration of the Bureau staff, the Department and EMS provider organizations. The ongoing paucity of resources, Bureau staff, and state legislative support is threatening the very integrity of the Wisconsin emergency medical services system.

Recommendations

- **The State of Wisconsin should assure an adequate, stable and ongoing source of funding and personnel resources for the Bureau of EMS and Injury Prevention.**

Examples from other states include an assessment on motor vehicle registration, a fee on driver's licenses, an assessment on moving traffic violations and a variety of others.

- The EMS Board, in coordination with other advisory bodies and various constituency groups, should develop a strategic plan to educate policy-makers regarding the importance of the emergency medical services system, including the financial and resource threats to its ongoing viability.

- The EMS Board and the Bureau of EMS and Injury Prevention should better delineate and streamline the inter-relationships of the various advisory councils and committees. To assure coordination and continuity, all committees and councils should report through the EMS Board.

- **The EMS Board should review the current use of FAP funds, including an evaluation of whether these funds are currently making the biggest possible impact on the Wisconsin EMS system. The Board should explore alternatives for utilization of FAP funds and make recommendations to the legislature. This might include, for instance, a grant program coordinated with the priorities outlined in the state EMS plan.**

- The EMS Board and the Department should, consistent with Wisconsin state laws and policies, develop methods for improved legislative advocacy. There should be an established mechanism for assuring legislation is introduced, when needed, to address EMS system priorities.

- The Department and the Governor's office should develop a procedure and a timetable to expedite the appointment of members to the EMS Board and clarify the role of the Department in suggesting appointments.

- The Department should, in conjunction with the legislative branch, determine the status of each legislative report which has been submitted and should report its findings to the EMS Board, the various committees and councils and to the constituency groups.

- The Department should pursue legislative authority for administrative penalties, including fines for violation of EMS statutes and administrative rules.

- The Department should pursue legislative authority to establish comprehensive regulation and enforcement of air, ground and water EMS services.

B. RESOURCE MANAGEMENT

Standard

Central coordination and current knowledge (identification and categorization) of system resources is essential to maintain a coordinated response and appropriate resource utilization within an effective EMS system. A comprehensive State EMS plan exists which is based on a statewide resource assessment and updated as necessary to guide EMS system activities. A central statewide data collection (or management information) system is in place that can properly monitor the utilization of EMS resources; data is available for timely determination of the exact quantity, quality, distribution and utilization of resources. The lead agency is adequately staffed to carry out central coordination activities and technical assistance. There is a program to support recruitment and retention of EMS personnel, including volunteers

Progress Since 1990

- Centralized authority and responsibility for program regulation, management, development and coordination was provided to the Department in 1993 legislation.
- The EMS Section was upgraded to Bureau status in 1998.
- Three staff positions were added.
- The Funding Assistance Program (FAP) offsets the costs for training of EMT-Basics.
- A State EMS Medical Director position was established and has been filled since March 1995.
- A formal State EMS Plan was first developed in 1995 and has been regularly updated.
- A State EMS Board was statutorily established in 1993.

Status

Wisconsin's statewide EMS plan was developed in 1995 and updated in 1997 and 1999. It is scheduled for another update this year. The plan is being followed closely for continued development of the state's EMS system. In addition, the status of the Bureau of EMS and Injury Prevention, as lead agency, has been strengthened.

Three additional elements of change have influenced the resource management aspect of the Bureau's operation in recent years. First, staffing has increased modestly. Secondly, the State EMS Medical Director's position is staffed through a contract. And lastly, the EMS Board has been active and successful in affecting the state EMS system.

Although modest staffing increases have occurred, some positions within the Bureau have been frozen or reallocated. Thus, the Bureau is unable to staff and implement some statutorily mandated. While there has been legislative support for authority and leadership on EMS activities, funding support is shrinking. As a result, a number of programs have not been implemented with resulting negative system impact. These include: technical assistance; data support, collection, and analysis; first responder certification; and the dispatch and communications program.

The Bureau has access to administrative data sources that can be used for resource management. These include geographical information system (GIS) software that can be used to show locations of hospitals, EMS agencies and aeromedical programs. Efforts are ongoing to streamline the provider agency operations plan submission process into a web-based application. These innovations may enable system managers to plan, allocate resources, administer services more efficiently and study system trending and conduct performance review.

The state's critical incident stress management (CISM) programs are growing in number and appear to be evolving. There appears to be little central coordination of activity or mutual aid among teams. Additionally, some teams lack professional clinical staff.

Recruitment and retention, as an ongoing issue for volunteerism, has received considerable attention in recent years. Two studies have been conducted with the initial conclusion that there are only pockets of concern. More recent information indicates there may be more concern than originally thought and that further action and monitoring is necessary.

Recommendations

The Bureau should:

- **Secure stable funding sources to ensure adequate staffing for resource management activities including, but not limited to:**
  - **Technical Assistance;**
  - **Data Support, Collection, and Analysis;**
  - **First Responder Certification;**
  - **Dispatch/Communication Program.**

- Develop programs for continuing the recruitment and retention of volunteer EMS personnel.

- **Verify submitted ambulance service operation plans through periodic, on-site evaluations.**

C. HUMAN RESOURCES AND TRAINING

Standard

EMS personnel can perform their mission only if adequately trained and available in sufficient numbers throughout the State. The State EMS lead agency has a mechanism to assess current manpower needs and establish a comprehensive plan for stable and consistent EMS training programs with effective local and regional support. At a minimum, all transporting out-of-hospital emergency medical care personnel are trained to the EMT-Basic level, and out-of-hospital training programs utilize a standardized curriculum for each level of EMS personnel (including EMS dispatchers). EMS training programs and instructors are routinely monitored, instructors meet certain requirements, the curriculum is standardized throughout the State, and valid and reliable testing procedures are utilized. In addition, the State lead agency has standardized, consistent policies and procedures for certification (and re-certification) of personnel, including standards for basic and advanced level providers, as well as instructor certification. The lead agency ensures that EMS personnel have access to specialty courses such as ACLS, PALS, BTLS, PHTLS, ATLS, etc., and a system of critical incident stress management has been implemented.

Progress Since 1990

Wisconsin has made significant progress toward meeting the recommendations of the 1990 NHTSA assessment.

- The state has the authority to approve all training centers and courses. A standardized instructor-training program has been implemented and standards for instructors are now stated in rule.

- An evaluation and modification of all national curricula used in EMS training has been completed.

- First Responder-Defibrillation criteria have been standardized. First Responder certification is authorized but has not been implemented due to shortages in personnel and financial resources. No progress has been made in implementing standardized training, licensure, and certification of Emergency Medical Dispatchers.

Status

The Bureau has the authority to approve all training centers and all courses. Instructors are certified and new rules will provide for the recertification of instructors. The state certifies First Responders-Defibrillation, EMT-Bs, EMT-Is and EMT-Ps. The state is currently in the process of implementing a new level called EMT- Basic-I.V., which is comparable to the prior EMT-I level. This will allow for additional skills at the EMT-Basic level. The new national EMT-I curriculum will also be implemented, and in Wisconsin is initially referred to as the EMT-I Enhanced, but will become the EMT-I after the transition.

Although the state has the authority to certify First Responders, it has not done so due to the lack of personnel and financial resources. The state has completed an in-depth review of the National Standard Curricula and has modified them to meet the specific needs of Wisconsin. The state has not conducted an evaluation of the *EMS Education Agenda for the Future* to determine its impact.

Bridge courses are currently offered but not at every level. Through the involvement of the Emergency Medical Services for Children (EMSC) program, pediatric training has been incorporated at all levels.

There are 22 approved training centers. Sixteen of the centers are technical colleges and six are hospitals. However, there is no independent, external verification of training centers by a national EMS accreditation organization as specified in the *EMS Education Agenda for the Future*.

The Bureau and the Wisconsin Technical College Systems Board (WTCSB) jointly provide a three day instructor/coordinator course on an annual basis.

All EMS personnel licenses expire every two years in June. During the last cycle it took 5-6 months for the Bureau to renew the licenses. In an effort to improve license turnaround time the Bureau has initiated a new process that will require personnel information to be submitted by each service on a roster signed by the local medical director. It is unclear whether or not the quality of the process will be maintained.

Recommendations

The State EMS Board should:

- **Evaluate the compliance of the Wisconsin EMS education system with the *EMS Education Agenda for the Future* and make specific recommendations to ensure that the Wisconsin EMS education system is consistent.**

The Bureau should:

- Establish a mechanism to obtain and utilize data to determine that approved training centers are providing quality instruction.

- Develop courses to allow EMS personnel to bridge from the entry level of certification through each level up to EMT-Paramedic.

- Develop a method, such as random audits, to ensure the consistent reliability and quality of the re-licensing process.

D. TRANSPORTATION

Standard

Safe, reliable ambulance transportation is a critical component of an effective EMS system. The transportation component of the State EMS plan includes provisions for uniform coverage, including a protocol for air medical dispatch and a mutual aid plan. This plan is based on current formal needs assessment of transportation resources, including the placement and deployment of all out-of-hospital emergency medical care transport services. There is an identified ambulance placement or response unit strategy, based on patient need and optimal response times. The lead agency has a mechanism for routine evaluation of transport services and the need for modifications, upgrades or improvements based on changes in the environment (i.e., population density). Statewide, uniform standards exist for inspection and licensure of all modes of transport (ground, air, water) as well as minimum care levels for all transport services (minimum staffing and credentialing). All out-of-hospital emergency medical care transport services are subject to routine, standardized inspections, as well as spot checks to maintain a constant state of readiness throughout the State. There is a program for the training and certification of emergency vehicle operators.

Progress Since 1990

Since the 1990 NHTSA assessment progress has been made in several areas.

- The Bureau has become more involved with the Wisconsin Department of Transportation (DOT) in developing ambulance inspection rules. They have also made recommendations regarding ambulance inspector qualifications.

- Standards are now in place for uniform requirements for ambulance equipment including pediatric equipment.

Status

Local law enforcement agencies reportedly respond to approximately 96% of motor vehicle crashes in Wisconsin. The training for local law enforcement personnel is the responsibility of the Department of Justice, with little interaction with the Bureau of EMS and Injury Prevention.

Ambulance inspections are conducted by state patrol personnel and are the responsibility of DOT. The Bureau works with DOT to develop the ambulance licensing rules and makes other suggestions regarding qualifications of inspection personnel. There are no air or water ambulance regulations.

There are no established criteria for reviewing operations plans and determining whether or not to issue an ambulance license. Standard equipment, including pediatric equipment, is now required on all ambulances.

Current rules allow for Basic Life Support ambulances to be staffed by one EMT and one EMT trainee. Proposed rules would allow for the staffing of Paramedic units by one Paramedic rather than two. The Bureau, EMS Board, American College of Emergency Physicians (ACEP) and others believe this change would allow for more EMS provider agencies to deliver paramedic level care in rural areas.

There is no statewide mutual aid or ambulance placement plan. Air ambulances establish their own service areas with no uniform rationale. It is unclear if the number and distribution of air ambulances serve the state effectively.

Recommendations

The Bureau should:

- **Obtain legislative authority to establish comprehensive regulations for air, water and ground EMS services.**
- Develop a statewide air ambulance coverage plan.
- **Develop objective criteria for approval/disapproval of ambulance service operation plans.**
- Develop a statewide mutual aid plan.
- Develop a program to "spot check" ambulance services for compliance with medical equipment and staffing.
- **Support the proposed rule allowing one EMT-Paramedic per EMT-Paramedic ambulance.**

E. FACILITIES

Standard

It is imperative that the seriously ill patient be delivered in a timely manner to the closest appropriate facility. The lead agency has a system for categorizing the functional capabilities of all individual health care facilities that receive patients from the out-of-hospital emergency medical care setting. This determination should be free of political considerations, is updated on an annual basis and encompasses both stabilization and definitive care. There is a process for verification of the categorizations (i.e., on-site review). This information is disseminated to EMS providers so that the capabilities of the facilities are known in advance and appropriate primary and secondary transport decisions can be made. The lead agency also develops and implements out-of-hospital emergency medical care triage and destination policies, as well as protocols for specialty care patients (such as severe trauma, burns, spinal cord injuries and pediatric emergencies) based on the functional assessment of facilities. Criteria are identified to guide interfacility transport of specialty care patients to the appropriate facilities. Diversion policies are developed and utilized to match system resources with patient needs; standards are clearly identified for placing a facility on bypass or diverting an ambulance to another facility. The lead agency has a method for monitoring if patients are directed to appropriate facilities.

Progress Since 1990

None.

Status

Following the initial EMS assessment in 1990, there were five recommendations directed at identifying the clinical capabilities of Wisconsin's hospitals, and utilization of that information to assure that the right patient is transported to the correct hospital. This issue received an appropriately low priority considering the constraints of manpower and funding. Therefore, the issue of facility categorization was folded into activities related to the trauma system, which is as yet not completed.

There has been no progress in facility categorization pending the institution of a trauma system, with the presumption that trauma categorization reflects capabilities across all medical disciplines. This may not be true. In the interim, EMS transport decisions have relied on physician referral preferences and perceived facility capabilities. However, this has not produced concrete information to be used for the development of rational EMS triage or transfer guidelines. It is unknown if there are still statutory requirements for facility categorization.

Recommendations

The Bureau should:

- **Initiate a process to document what is already known about the capabilities of all hospitals that interface with Wisconsin EMS.**

- Incorporate this information into the prehospital triage and interfacility destination policies being developed.

- Assess the current impact of hospital diversion on EMS services, particularly in urban areas. Develop uniform criteria to be used in making emergency department diversion decisions.

F. COMMUNICATION

Standard

A reliable communications system is an essential component of an overall EMS system. The lead agency is responsible for central coordination of EMS communications (or works closely with another single agency that performs this function) and the state EMS plan contains a component for comprehensive EMS communications. The public can access the EMS system with a single, universal emergency phone number, such as 9-1-1 (or preferably Enhanced 9-1-1), and the communications system provides for prioritized dispatch. There is a common, statewide radio system that allows for direct communication between all providers (dispatch to ambulance communication, ambulance to ambulance, ambulance to hospital, and hospital to hospital communications) to ensure that receiving facilities are ready and able to accept patients. Minimum standards for dispatch centers are established, including protocols to ensure uniform dispatch and standards for dispatcher training and certification. There is an established mechanism for monitoring the quality of the communication system, including the age and reliability of equipment.

Progress Since 1990

- No communications system funding sources have been identified.
- Evaluation of statewide communications needs and potential infrastructure development is ongoing.
- E-911 coverage will be in place for 99% of the population by 2002.
- Microwave system integration with EMS frequencies ia no longer needed and equipment is being removed.
- The existing EMS communications system works and is supplemented by standing orders and cell phone systems.
- The EMS Board is considering the development of legislation for training and licensure of EMS dispatchers and dispatch centers.

Status

The Wisconsin EMS system is served by an outdated VHF and UHF radio system for ambulance to hospital communications. While providers and the EMS Board agree that the current system is

outdated, they feel it meets their needs and is supplemented in several areas by standing orders and cellular phone systems. No single, statewide EMS communications system exists. Rather, a fragmented and non-interoperable system is in place. However, it appears to meet the needs and satisfaction of EMS providers in their day-to-day operations. Local dispatch systems range from state-of-the-art to systems that are old, outdated and possibly out-of-compliance with FCC standards.

The state has partnered with other agencies and stakeholders to attempt to remedy the situation by identifying its needs and developing a plan for a comprehensive telecommunications system. The study conducted by Evans and Associates for the Wisconsin Interagency Committee on Radio Tower Sites (WICORTS) in 1992 provided recommendations. However, absence of funding prohibited continuation of this initiative.

E-911 access to local EMS systems continues to improve and is almost universal in Wisconsin. It is believed that E-911 will be operational in all counties but one by 2002. Current activity by the Systems Management Committee of the EMS Board revolves around a "white paper" and potential legislation which would enable the EMS Bureau to establish training, dispatch center standards and EMS dispatcher standards for licensure. Funding for staff support of this program is also proposed.

Another consideration for a comprehensive EMS communications system is standards for medical control resource hospitals. Currently, none exist and hospital radios are staffed randomly by physicians and physician surrogates. There is no system for monitoring the on-line medical control structure for quality assurance purposes.

The Wisconsin EMS Communications/Telemetry Standards and Guidelines were released in 1983. They are slated for revision utilizing the 1992 *NHTSA EMS Communications Planning Guideline*.

Recommendations

The Bureau should:

- **Pursue statutory training and licensure standards for EMS dispatchers and dispatch centers to include funding for program support and personnel.**
- Complete the revised comprehensive state EMS communications plan.
- **Establish on-line medical control and resource hospital standards.**
- Network with other state EMS offices and state and national EMS and communications associations for information and solutions to EMS communications problems.

- Take appropriate actions to disallow seven digit telephone number advertising for emergency ambulance service access where 9-1-1 is available.

G. PUBLIC INFORMATION, EDUCATION AND PREVENTION

Standard

To effectively serve the public, each State must develop and implement an EMS public information and education (PI&E) program. The PI&E component of the State EMS plan ensures that consistent, structured PI&E programs are in place that enhance the public's knowledge of the EMS system, support appropriate EMS system access, demonstrate essential self-help and appropriate bystander care actions, and encourage injury prevention. The PI&E plan is based on a needs assessment of the population to be served and an identification of actual or potential problem areas (i.e., demographics and health status variable, public perceptions and knowledge of EMS, type and scope of existing PI&E programs). There is an established mechanism for the provision of appropriate and timely release of information on EMS-related events, issues and public relations (damage control). The lead agency dedicates staffing and funding for these programs, which are directed at both the general public and EMS providers. The lead agency enlists the cooperation of other public service agencies in the development and distribution of these programs, and serves as an advocate for legislation that potentially results in injury/illness prevention.

Progress Since 1990

Although there is inadequate funding and staff to support system-wide public information and education, the Wisconsin EMS system has made progress in accomplishing the objectives since the last assessment:

- Some Bureau of EMS and Injury Prevention staff are now working on public information and education activities.
- There is a separate section of Injury Prevention located in the Bureau of EMS and Injury Prevention; there are staff dedicated to injury prevention.
- There has been some progress in involving EMS providers in public information and injury prevention.
- There are many public information and education activities included in the EMS provider's handbook.

Status

The Bureau of EMS and Injury Prevention has received a four year Centers for Disease Control and Prevention (CDC) grant to develop the infrastructure for a statewide injury prevention program, including efforts to increase the involvement of EMS providers in injury prevention. The EMSC coordinator facilitates some public information and education activities.

The Bureau has integrated a considerable amount of public information and education with its regular customer contacts. Examples include the development of an outstanding EMS and Injury Prevention web site and developing a numbered memo series to keep EMS providers informed of current EMS developments. The state highway traffic safety office sponsored a train the trainers program in Public Information, Education and Relations (PIER). Since 2000, a quarterly EMS and injury prevention newsletter, *Hi Lights and Sirens*, has been developed and widely distributed to a large audience including EMS providers, other health care providers, public health departments, law enforcement agencies, fire personnel, advocacy groups and others.

There has been considerable progress with the establishment of a statewide injury prevention program. An Injury Prevention Section supervisor has been hired, and there has been work in suicide prevention, falls prevention and involvement with Safe Communities. The Injury Prevention Section will be guiding the development of a strategic plan for injury prevention, including identification of the methods by which EMS providers can be involved. The second annual state Conference on Childhood Emergencies includes injury prevention topics.

The EMSC program has done substantial work to promote numerous programs; including the Child Alert Program, Basic Emergency Life Support Skills for Schools, Project ADAM, the Conference on Childhood Emergencies and legislative advocacy. The enthusiasm and energy of the EMSC staff, the EMSC Advisory Committee and volunteers are commendable!

Recommendations

- **The Bureau of EMS and Injury Prevention should develop a broad-based public information and education plan which targets, in part, policy makers and the general public. Among other topics, this should address emergency medical services and trauma systems.**

- The Bureau should incorporate graduates of the PIER program in its plans to involve EMS providers in improved public information and education.

- The ambulance providers should include information about EMS public information, education and injury prevention activities in their ambulance operations plans.

- The Bureau should include additional information about public information and education in the Wisconsin *EMS and Injury Prevention Handbook*.

H. MEDICAL DIRECTION

Standard

EMS is a medical care system that involves medical practice as delegated by physicians to non-physician providers who manage patient care outside the traditional confines of office or hospital. As befits this delegation of authority, the system ensures that physicians are involved in all aspects of the patient care system. The role of the State EMS Medical Director is clearly defined, with legislative authority and responsibility for EMS system standards, protocols and evaluation of patient care. A comprehensive system of medical direction for all out-of-hospital emergency medical care providers (including BLS) is utilized to evaluate the provision of medical care as it relates to patient outcome, appropriateness of training programs and medical direction. There are standards for the training and monitoring of direct medical control physicians, and statewide, standardized treatment protocols. There is a mechanism for concurrent and retrospective review of out-of-hospital emergency medical care, including indicators for optimal system performance. Physicians are consistently involved and provide leadership at all levels of quality improvement programs (local, regional, state).

Progress Since 1990

- The position of State Medical Director for the Emergency Medical Services Program (State EMS Medical Director) was established.
- Minimum credential requirements were established for physicians serving as EMS medical directors.
- Medical direction became required for all EMS providers credentialed at the levels of First Responder-Defibrillation through EMT-Paramedic.
- Development of standing orders for EMS providers was enabled.
- Some statewide EMS protocols have been developed.

Status

In the past eleven years a great deal has been accomplished to improve the state of EMS medical direction in Wisconsin. The current state medical director for the emergency medical services program enjoys abundant respect for his knowledge, integrity, and commitment to the program, and he is seen as highly credible. The Physician Advisory Committee has become a valuable resource for deliberating EMS clinical issues, advising the state EMS medical director, and creating useful products for the state EMS medical director, the Bureau of EMS and Injury Prevention, and local EMS medical directors.

More than 250 physicians provide medical direction for the state's 450 local EMS programs. For urban and suburban programs, usually providing higher levels of service, these physicians are typically very qualified and progressive. In more rural settings, medical directors may have limited EMS-related experience and expertise, but provide this needed service in fulfillment of a sense of civic duty. Their qualifications may be no more than being a licensed physician and willingness to serve. A handbook developed by the Physician Advisory Committee is a valuable resource for EMS medical directors and is required reading.

The scope of service or practice (i.e., specific options for care) of each EMS program is, to a large extent, at the discretion of the local EMS medical director, within confines established by the Bureau of EMS and Injury Prevention. Standing orders can provide EMS personnel with the necessary authorization to deliver immediately needed treatment. Additionally, EMS medical directors may designate other physicians or non-physicians to provide on-line medical control via radio or telephone communications. However, there are no statewide standards regarding the qualifications of personnel who might deliver this service.

Emergency medical services medical directors, after due process, may restrict the clinical activities of individual EMS practitioners under their auspices. This authority with regard to EMT-Paramedics is currently pending in the rulemaking process, but is expected soon.

The accountability of EMS medical directors is difficult to establish. The authority of the state EMS medical director with regard to local EMS medical directors is ambiguous.

Recommendations

The Bureau should:

- **Continue to work to enhance the required credentials of EMS medical directors, based upon the level of the EMS programs involved.**

- Establish minimum credentials for those who may be designated to provide on-line medical control, possibly requiring completion of a base-station provider course.

- **Develop periodic statewide and regional forums for local EMS medical directors to meet with the state EMS medical director and other Bureau staff, discuss common issues, and share solutions, and exploit electronic options for facilitating continual interaction among EMS medical directors.**

- **Ensure that all interfacility patient transports are conducted with adequate medical direction and appropriate availability of on-line medical control.**

- Develop due process guidelines for use by local EMS medical directors.

- **Ensure that the state medical director for the emergency medical services program is the lead contact at the Department of Health and Family Services regarding clinical care implications for any contemplated EMS system policy or procedure change.**

- Clarify the authority of the state medical director for the emergency medical services program with regard to local/regional EMS medical directors.

I. TRAUMA SYSTEMS

Standard

To provide a quality, effective system of trauma care, each State must have in place a fully functional EMS system; trauma care components must be clearly integrated with the overall EMS system. Enabling legislation should be in place for the development and implementation of the trauma care component of the EMS system. This should include trauma center designation (using ACS-COT, ACEP, APSA-COT and/or other national standards as guidelines), triage and transfer guidelines for trauma patients, data collection and trauma registry definitions and mechanisms, mandatory autopsies and quality improvement for trauma patients. Information and trends from the trauma registry should be reflected in PIER and injury prevention programs. Rehabilitation is an essential component of any statewide trauma system and hence these services should also be considered as part of the designation process. The statewide trauma system (or trauma system plan) reflects the essential elements of the Model Trauma Care System Plan.

Progress Since 1990

- In response to the recommendations of the NHTSA Technical Assistance Team (TAT), a legislative study committee was convened, resulting in the passage of Wisconsin Acts 16 & 251 in 1993.

- The EMS Board developed an initial Trauma Report.

- In response to the 1996 Trauma report, initial trauma legislation was passed in 1997. Wisconsin Act 154, 1997, gave statutory authority for the Bureau of EMS and Injury Prevention to appoint a Statewide Trauma Advisory Council (STAC) and to develop rules and to implement the system.

- The DHFS and STAC were charged to prepare a report on implementation of a statewide trauma care system, to be submitted to the legislature on January 1, 2001 for review by the Joint Committee on Finance. The report outlines the development of an inclusive trauma system addressing most, but not all, of the recommendations of the TAT. The report has been submitted and is awaiting approval of the Joint Finance Committee and subsequent funding.

Status

The Department has an enabling statute to form an advisory council, to write a trauma system plan, and to seek approval and funding for the system. A state trauma coordinator has recently been hired to assist in system development and initiation. Many of the essential components of a trauma system are

available, including EMS systems, a training infrastructure, and established regional trauma referral patterns. Although the Wisconsin State American College of Surgeons Committee on Trauma seems not to be engaged in the trauma system effort, that organization offers ATLS access in four sites adequate for the training needs of physicians and physician extenders. Wisconsin has 128 well distributed hospitals, two of which are Level I and ACS verified, and nine of which are identified as Level II, of which two are ACS verified.

Currently, the advancement of the trauma program is hindered by limitations in funding, shortage of staff, and by limited trauma expertise within the Bureau. The current trauma system plan does not include a provision for designation of trauma hospitals, allows level III and IV hospitals to certify without verification, and does not allow for control of participants based on system needs. The statewide trauma registry implementation strategy is slow, allowing delay in participation by smaller hospitals, uses data sets that vary by hospital size, suggests the use of data sources that may not provide accurate trauma information, and seems not to emphasize the importance of the systems component. The six year estimated development timeline will significantly delay the benefits of system and hospital quality improvement.

Recommendations

The Bureau should:

- **Arrange for an American College of Surgeons Committee on Trauma, trauma systems consultation**.
- **Seek statutory authority to designate trauma facilities.**
- **Identify or develop and fund an acceptable and consistent statewide trauma systems registry.**
- **Continue to pursue dedicated funding for implementation and operation of the trauma system.**
- If the ACS verification process is to be used for designation, amend the statute to reflect a three-year designation cycle.

J. EVALUATION

Standard

A comprehensive evaluation program is needed to effectively plan, implement and monitor a statewide EMS system. The EMS system is responsible for evaluating the effectiveness of services provided victims of medical or trauma related emergencies, therefore the EMS agency should be able to state definitively what impact has been made on the patients served by the system. A uniform, statewide out-of-hospital data collection system exists that captures the minimum data necessary to measure compliance with standards (i.e., a mandatory, uniform EMS run report form or a minimum set of data that is provided to the state); data are consistently and routinely provided to the lead agency by all EMS providers and the lead agency performs routine analysis of this data. Pre-established standards, criteria and outcome parameters are used to evaluate resource utilization, scope of services, effectiveness of policies and procedures, and patient outcome. A comprehensive, medically directed, statewide quality improvement program is established to assess and evaluate patient care, including a review of process (how EMS system components are functioning) and outcome. The quality improvement program should include an assessment of how the system is currently functioning according to the performance standards, identification of system improvements that are needed to exceed the standards and a mechanism to measure the impact of the improvements once implemented. Patient outcome data is collected and integrated with health system, emergency department and trauma system data; optimally there is linkage to databases outside of EMS (such as crash reports, FARS, trauma registry, medical examiner reports and discharge data) to fully evaluate quality of care. The evaluation process is educational and quality improvement/system evaluation findings are disseminated to out-of-hospital emergency medical care providers. The lead agency ensures that all quality improvement activities have legislative confidentiality protection and are non-discoverable.

Progress Since 1990

- A report regarding EMS data collection needs was sent to the legislature in 1995, resulting in no legislative action.
- The Wisconsin EMS Information System (WEMSIS) was developed and was made available to EMS provider agencies.
- As part of WEMSIS, a standardized EMS patient care record was developed.
- Quality assurance components must be included in all ambulance operations plans.
- Plans have been developed to provide feedback to EMS managers and providers who submit data to the Bureau of EMS and Injury Prevention.

Status

The process of evaluation and ongoing quality improvement programs remain underdeveloped in Wisconsin. At the core of the issue is the lack of a statewide system for collecting EMS-related data, lack of a central repository for EMS-related data, and lack of technical and general manpower resources to analyze what relatively little data are available. Development of the WEMSIS was quite a noteworthy accomplishment, which has received considerable recognition within and outside of Wisconsin. However, its widespread use has been hampered by variation in technical capacity among the state's EMS provider agencies and lack of technical support, among other things. Currently, less than 10% of the state's EMS provider agencies use WEMSIS. The remaining agencies do not routinely submit data to a central repository. There are no standard procedures for analyzing data submitted to the Bureau of EMS and Injury Prevention or for providing feedback to those who have contributed to the data pool. Thus, there exists a paucity of credible information to describe the current EMS system across the state of Wisconsin, or that can be used to monitor its status. There is no system that can be employed to help assess the effects of EMS system structural or process changes intended to create improvements. Attempts to determine the effects of improvement initiatives often rely on self-reporting by EMS provider agencies, qualitative data submitted by EMS providers, sampling techniques with uncertain validity, or gestalt.

The state medical director for the emergency medical services program maintains principal authority for maintaining the state's EMS quality assurance / improvement program. A number of initiatives have been completed, or are under development, intended to improve the quality of EMS in Wisconsin. However, as the availability of current data is typically lacking, ongoing assessment of the effects of instituted changes is impossible. Although EMS provider agencies (i.e., ambulance services) are required to participate in quality improvement activities, there is no assurance that they actually are engaged. There is skepticism that many EMS providers and managers possess an adequate working knowledge of the fundamental processes of evaluation and quality improvement.

Within Wisconsin state government and the Department of Health and Family Services, there seem to be current projects and resources with which collaboration could potentially improve the ability to acquire and analyze EMS-related data. These include the Bureau of Health Information, which is currently charged to evaluate data from hospital emergency departments, a successful Crash Outcomes Data Evaluation System (CODES) project, and a funded injury epidemiologist position within the Injury Prevention Section.

Recommendations

The Bureau should:

- **Seek the authority for the Bureau of EMS and Injury Prevention to mandate that EMS provider agencies submit specific data elements to a central repository.**

- Conduct a NHTSA EMS Information Systems (EMSIS) workshop.

- **Conduct a NHTSA Leadership Workshop for Quality Improvement.**

- Assign the Injury Prevention Section's injury epidemiologist to evaluate all possible sources of EMS-related data in the state, and their potential for linkage with a central EMS database.

- **Develop and adequately fund the position of EMS data manager and technical consultant within the Bureau of EMS and Injury Prevention.**

- **Develop WEMSIS as an internet-based EMS patient care report that would automatically populate the state's EMS database, enabling immediate queries at the Bureau of EMS and Injury Prevention and also limited queries by EMS provider agencies.**

- **Provide summary feedback information, derived from submitted data, in a predictable periodic manner to the state's EMS provider agencies.**

- Develop a collaborative relationship between the Bureau of EMS and Injury Prevention and the Bureau of Health Information that facilitates data sharing and linkage to outcome information.

- Develop ongoing quality improvement programs, including templates for evaluation and action that can be adapted at the state and local EMS levels.

- Seek legislation to ensure that information derived as part of formal EMS peer review or quality improvement projects is not discoverable during cases of civil action.

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ORGANIZATIONS/APPOINTMENTS

North Carolina, Office of Emergency Medical Services, Director, 1985-1999.
National Association of State EMS Directors (NASEMSD), Past President
Executive Committee, various committee chairs, NASEMSD
National Association of Governor's Highway Safety Representatives, Liaison 1990-1991
National Association of EMS Physicians, Liaison
Management Team EMS Clearinghouse, NASEMSD 1986-1991
National Association of State EMS Training Coordinators
Past Member Board of Directors
North Carolina Division, American Trauma Society, Board of Directors
North Carolina Governor's Task Force on Injury Prevention and Control
North Carolina Medical Society Disaster And EMS Committee
North Carolina Medical Society Bioethics Subcommittee, Advisor
ASTM F. 30 Committee on Emergency Medical Services
National EMS Alliance (NEMSA)
Initial Coordination Committee Chairman
National Traffic Records Assessment Team, Member, States of Idaho and Delaware.
EMS Agenda For the Future, Steering Committee
EMS for Children program site visit States of Hawaii, Virgin Islands, Minnesota, Maine, Oregon, Florida, Colorado, and Georgia
DOT/NHTSA, Emergency Medical Services Assessment Program, Technical Assistance Team, Member, States of Louisiana, Arizona, Florida, Idaho, Kansas, Kentucky, New Jersey, Virginia, Vermont, West Virginia, and America Samoa
EMS Reassessment Program, Technical Assistance Team, Member, States of Minnesota, Alaska, Connecticut and Pennsylvania
Board of Directors, National Registry EMTs 1996-1999
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National EMS-C Advisory Committee, Member, 1996-present
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- Policy and Procedures Committee,
- Vice Chair, Board of Directors
- Chairman, Board of Directors
- Standard Settings, EMT-Basic Examination technicians
- EMT-Basic Transition Curriculum Group
- AD HOC Committee on Americans with Disabilities
- EMT-P, EMT-B Practice Analysis Task Force

NHTSA
- Member, Uniform Prehospital Data Set Task Force and Consensus Conference
- Invited Participant
- NHTSA Workshop on Methodologies for Measuring Morbidity and Outcomes in Emergency Medical Services

Division of Trauma and EMS, HRSA
- Trauma Data Set Committee
- Task Force "Evaluation Trauma Systems"

Chair National EMS and Education Practice Blueprint

National Association of State EMS Directors
- Past Secretary
- Legal Recognition Committee
- Chair, National Registry Committee
- Chair, Data Committee
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President Elect
Conference Committee Chair, Rural Issues Committee Chair
National Rural Health Association, Chair, Ad Hoc Subcommittee for Rural/Frontier EMS
Position Paper
Centers for Disease Control and Prevention Grant
Principal Investigator, Fatality Assessment and Control Evaluation Program
National Research Council, Transportation Research Board, Strategic Highway Safety Plan,
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National Registry of EMTs, Board of Directors, Standards and examinations Committee, Practice Analysis Committee, Oral Station Development Committee, Data Committee, Strategic Planning Committee,
National Rural EMS Leadership Conference, Invitee
EMS Agenda for the Future, National Leaders Conference, Invitee
EMS-C Five-Year Plan Task Force, Member
Former, National Association for Search and Rescue, Fundamental Search and Rescue Course Instructor
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National Association of State EMS Directors (1979-1996)
Past President
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National Association EMS Physicians, Member
American Medical Association
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American Trauma Society
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Institute of Medicine/National Research Council
Pediatric EMS Study Committee, Member
Committee Studying Use of Heimlich Maneuver on Near Drowning Victims, Member
World Association on Disaster and Emergency Medicine
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Montana EMS Advisory Council, Chair
Montana ATLS, National Faculty
Rocky Mountain Rural Trauma Symposium
  Program Director
American College of Surgeons, Fellow
  MT Committee on Trauma, Chairman 1978-1988
ACS Committee on Trauma 1986-1996
  ATLS Committee/National Faculty
  AD HOC Committee for Revision of Optimal Resources Document
  Past Chairman, Emergency Services/Prehospital Subcommittee
  Past Chairman, AD HOC Committee on Rural Trauma
Centers for Disease Control, Consensus Committee on Trauma Registries
Task Force for Acute Care System, Trauma, HRSA
USDOT, NHTSA EMS Program, Technical Assistance Team, Member, States of Alaska, Iowa, Nebraska, Tennessee, West Virginia, Indian Health Service, National Park Service, American Samoa and Alaska Reassessment.